

IN THE CLAIMS

Please amend claims 1, 17 and 18 as follows:

1. (CURRENTLY AMENDED) A (B, Al, Ga, In)N based light emitting diode (LED), wherein light from an emitting layer is extracted through a surface of the nitrogen face (N-face) of the LED and the surface of the N-face of the LED is structured into a plurality of cones to enhance extraction of the light out of the surface, and each of the cones is at least the size of the wavelength of the light extracted through the surface.

2. (PREVIOUSLY PRESENTED) The LED of claim 1, wherein the surface of the N-face is structured into one or more cones.

3. (PREVIOUSLY PRESENTED) The LED of claim 1, wherein the structured surface reduces light reflections occurring repeatedly inside the LED, and thus extracts more light out of the LED.

4. (PREVIOUSLY PRESENTED) The LED of claim 1, wherein the surface of the N-face is structured by an anisotropic etching.

5. (PREVIOUSLY PRESENTED) The LED of claim 4, wherein the anisotropic etching is a dry etching.

6. (PREVIOUSLY PRESENTED) The LED of claim 25, wherein the wet etching is a photo-enhanced chemical (PEC) etching.

7. (PREVIOUSLY PRESENTED) The LED of claim 1, wherein the N-face is an n-type layer of the LED.

8. (PREVIOUSLY PRESENTED) The LED of claim 1, wherein the N-face is prepared by a laser lift off (LLO) technique.

9. (PREVIOUSLY PRESENTED) The LED of claim 1, wherein the LED is grown on a c-plane GaN wafer and a gallium face (Ga-face) is a p-type layer.

10. (PREVIOUSLY PRESENTED) The LED of claim 1, wherein the LED is comprised of an n-type electrode, n-type layer, active region, p-type layer and p-type electrode.

11. (PREVIOUSLY PRESENTED) The LED of claim 10, wherein the n-type layer, active region and p-type layer are each comprised of a (B, Al, Ga, In)N alloy.

12. (PREVIOUSLY PRESENTED) The LED of claim 10, wherein the p-type electrode has a property of high reflection to decrease light absorption and to increase light reflection toward the surface of the n-type layer.

13. (PREVIOUSLY PRESENTED) The LED of claim 10, wherein the LED includes a current-blocking layer aligned under the n-type electrode to keep the current from concentrating below the n-type electrode, so that absorption of light emission under the n-type electrode can be avoided and extraction efficiency can be increased.

14. (PREVIOUSLY PRESENTED) The LED of claim 10, wherein the LED includes a current-confining frame made of an insulator to restrain leakage current through the sidewalls of the LED without significantly decreasing an emitting area.

15. (PREVIOUSLY PRESENTED) The LED of claim 2, wherein the structured surface is comprised of a plurality of hexagonal shaped cones that have an angle equal to or smaller than:

$$2\sin^{-1}(n_{air}/n_s)$$

where n_{air} is a refractive index of air and n_s is a refractive index of the structured surface.

16. (PREVIOUSLY PRESENTED) The LED of claim 2, wherein the structured surface is comprised of a plurality of hexagonal shaped cones that have an angle equal to or smaller than:

$$2 \sin^{-1}(n_{enc} / n_s),$$

where n_{enc} is a refractive index of epoxy on the structured surface and n_s is a refractive index of the structured surface.

17. (CURRENTLY AMENDED) A method of creating a (B, Al, Ga, In)N based light emitting diode (LED), wherein light from an emitting layer is extracted through a structured surface of a nitrogen face (N-face) of the LED, comprising:

fabricating one or more layers of the (B, Al, Ga, In)N based LED on a substrate;
exposing a nitrogen face (N-face) surface of the layers by removing the substrate from the layers; and
structuring the surface of the N-face after growth the substrate is removed to enhance extraction of light from the emitting layer out of the surface.

18. (CURRENTLY AMENDED) A (B, Al, Ga, In)N light emitting diode (LED) comprised of an n-type electrode, n-type layer, active region, p-type layer and p-type electrode, wherein a nitrogen face (N-face) surface of the n-type layer is structured after growth ~~so that to~~ enhance extraction of light emitted from the active region ~~is extracted~~ through the structured N-face surface of the n-type layer.

19. (PREVIOUSLY PRESENTED) The method of claim 17, wherein the surface of the N-face is structured into one or more cones.

20. (PREVIOUSLY PRESENTED) The method of claim 17, wherein the N-face surface of the n-type layer is structured using an anisotropic etching.

21. (PREVIOUSLY PRESENTED) The method of claim 20, wherein the anisotropic etching is a dry etching.

22. (PREVIOUSLY PRESENTED) The method of claim 20, wherein the anisotropic etching is a wet etching.

23. (PREVIOUSLY PRESENTED) The method of claim 22, wherein the wet etching is a photo-enhanced chemical (PEC) etching.

24. (PREVIOUSLY PRESENTED) The method of claim 17, wherein the surface of the N-face is structured by roughening or patterning.

25. (PREVIOUSLY PRESENTED) The LED of claim 4, wherein the anisotropic etching is a wet etching.

26. (PREVIOUSLY PRESENTED) The LED of claim 1, wherein the surface of the N-face is structured by roughening or patterning.